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Sustainable mountain development

Report of the Secretary-General

Summary

Mountain and upland areas have a universal importance: they provide water and other global goods and services to humanity. However, mountain ecosystems are highly vulnerable to climate change, extreme weather events and land degradation and recover slowly from disasters and shocks. In the 2030 Agenda for Sustainable Development, Member States pledged to leave no one behind and stressed the importance of reaching those furthest behind first. Mountain communities in developing countries are particularly vulnerable and require special attention, given that one in three people in those areas is at risk of hunger and malnutrition.

To achieve the Sustainable Development Goals and the targets relating to mountains as well as to poverty, hunger, sustainable agriculture, climate change and gender equality, there is a need to prioritize mountain areas by focusing on the specific challenges they face and the opportunities they provide. Mountain-specific policies and the inclusion of mountain communities in decision-making processes and capacity development can improve the livelihoods of communities while also conserving and restoring mountain ecosystems. In particular, efforts should be made to increase scientific knowledge of mountains and collect disaggregated data for sound analysis, policy advice and, ultimately, for change.

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Introduction

1. In 1998, the General Assembly, in its resolution 53/24, proclaimed 2002 the International Year of Mountains and encouraged Governments, the United Nations system and all other actors to take advantage of the year to increase awareness of the importance of sustainable mountain development. In 2003, the Food and Agriculture Organization of the United Nations (FAO) prepared a report on the achievements of the year, which was transmitted to the Assembly by the Secretary-General (A/58/134).

2. The activities of the International Year of Mountains supported the establishment of 78 national committees for country-level action and strengthened partnerships with stakeholders in mountain issues, culminating in the launch of the International Partnership for Sustainable Development in Mountain Regions (Mountain Partnership) at the World Summit on Sustainable Development, held in 2002.

3. The International Year of Mountains led to the adoption by the General Assembly of resolution 57/245, in which 11 December was designated as International Mountain Day, as of 2003, and the international community was encouraged to organize events at all levels on that day to highlight the importance of sustainable mountain development.

4. The present report is submitted in accordance with General Assembly resolution 68/217, in which the Assembly requested the Secretary-General to submit a report at its seventy-first session on the status of implementation of sustainable development in mountain regions. The report was prepared by FAO and the Mountain Partnership secretariat in collaboration with Governments, relevant agencies of the United Nations system and other organizations.

Background and challenges

5. Covering about 22 per cent of the world's land surface, mountains are home to about 13 per cent of the world's population and provide globally essential goods and services such as fresh water, biological diversity, food and energy. They are areas of cultural diversity, knowledge and spirituality, as well as destinations for recreation and tourism. In the mountain areas of developing countries, however, the risk of food insecurity affects one in every three people. Between 2000 and 2012, the number of people in the mountain areas of developing countries who were vulnerable to food insecurity increased across the world. In 2000, more than 250 million people living in mountain areas were considered to be vulnerable to food insecurity, representing about 35 per cent of the global mountain population at that time. By 2012, a new FAO study[1] had found that, while the global mountain population had increased just 16 per cent overall, the number of those vulnerable to food insecurity had increased by 30 per cent, to nearly 329 million, corresponding to 39 per cent of the global mountain population in 2012. The results show that global progress and improvements in living standards do not appear to have made their way up the mountains, and many mountain communities lag behind in the eradication of poverty and hunger.

[1] R. Romeo and others, *Mapping the Vulnerability of Mountain Peoples to Food Insecurity* (Rome, FAO, 2015).

6. Climate change, climate variability and climate-induced disasters, combined with political, economic and social marginalization, increase the vulnerability of mountain peoples to food shortages and extreme poverty. Limited access to education, health, training, credit and market facilities further hinders development and leads to out-migration.

7. Mountain communities, with their knowledge, experience and capacity to adapt to fragile environments, can provide sustainable natural resources management solutions. Mountain peoples, who are largely family farmers, have, over centuries, developed a system of resilient practices to cope with scarce natural resources and difficult living conditions, basing their livelihoods on highly diversified activities. Mountain agriculture uses low levels of fossil fuels, mineral fertilizers and pesticides and has less of an impact on the environment compared with lowland farming.

Mountains and the 2030 Agenda for Sustainable Development

8. The 2030 Agenda for Sustainable Development includes the following three targets that directly address sustainable mountain development:

(a) Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;

(b) Target 15.1: By 2020, ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements;

(c) Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.

9. The Mountain Partnership secretariat is the entity within FAO responsible for measuring efforts to reach target 15.4 and has developed the Mountain Green Cover Index as an official indicator, based on the recognition that there is a direct correlation between green coverage of mountain areas and their state of health and capacity to fulfil their ecosystem roles. Monitoring changes in mountain vegetation over time provides an adequate measure of the status of the conservation of mountain ecosystems. Monitoring the Index over time can provide information on the forest, agricultural and vegetal cover, the reduction of which could be linked to overgrazing, land clearing, urbanization, forest exploitation, timber extraction and fuelwood collection. Its increase could be linked to land restoration, reforestation, afforestation or agricultural practices. The indicator is based on Collect Earth, a free, open-source tool that is customizable for specific data collection needs and methodologies. It builds upon high-resolution, multi-temporal images from Google Earth and Bing Maps and Landsat 7 and 8 datasets from Google Earth Engine. Data and images are stored and globally available and for any year starting from 2000, making possible the monitoring of change over time. Data on mountain areas have been taken from the 2015 FAO/Mountain Partnership secretariat global map of mountains.

Climate change in mountains (Sustainable Development Goal 13)

10. In mountain ecosystems, increasing temperatures are worsening the conditions of many mountain communities, which are already food-insecure and poor. The Global Ecosystem-based Adaptation in Mountain Ecosystem Programme was jointly implemented from 2011 to 2016 as a flagship programme of the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP) and the International Union for Conservation of Nature, funded by the Government of Germany through the International Climate Initiative, and in partnership with the Governments of Nepal, Peru and Uganda. The Programme focuses on an approach that assists communities in adapting to the adverse impact of climate change through the sustainable management, conservation and restoration of natural and agroecosystems as part of an overall adaptation strategy. This takes into account anticipated trends in the impact of climate change in order to reduce vulnerability and improve the resilience of ecosystems and people to the impact. Lessons learned include the need for a step-wise approach in carrying out initial participatory assessments to make the case for ecosystem-based adaptation to communities; the need for vulnerability and impact assessments to make the case for the use of ecosystem-based adaptation measures to reduce vulnerabilities; the need to promote early action through incentive schemes before the full benefits of ecosystem-based adaptation can be seen; and the need to adopt a landscape approach.

11. Austria supports UNEP in fostering regional and interregional cooperation on climate change adaptation in mountain regions in the Andes, the South Caucasus, East Africa, Central Asia and the western Balkans through the UNEP-led project entitled "Climate change action in developing countries with fragile mountainous ecosystems from a sub-regional perspective". As part of the project, UNEP produced the *Mountain Adaptation Outlook* series that includes a collection of adaptation best practices, including with respect to research and monitoring efforts essential to developing effective local responses and pilot projects ripe for upscaling. As a concrete follow-up, several mountain countries, such as Azerbaijan and Georgia, have already committed themselves to strengthening action on adaptation to climate change in mountain ecosystems, using technical assistance and financial instruments such as the Green Climate Fund and the Adaptation Fund.

12. Some risks shared by most or all mountain regions include the movement of vector-borne diseases into higher elevations as a result of global warming, reduced water availability owing to the melting of glaciers and the degradation of highland ecosystems such as wetlands and grasslands; biodiversity loss; and crop failures owing to increases in extreme weather events. Across regions, the development of adaptation measures is still in the early stages. Recommendations include measures such as expanding the monitoring of hydrology, early-warning systems for natural disasters, promoting drought-resistant crops, increasing the participation of women and ethnic minorities and strengthening coordination between stakeholders in freshwater resources, including international coordination in the management of shared basins.

13. Participants in the ministerial meeting of the Interstate Commission on Sustainable Development, held in Dushanbe from 24 to 28 November 2014, recognized the need for enhanced action towards climate change adaptation in mountain regions. As a result, the Commission, its Regional Mountain Centre for Central Asia and UNEP agreed to jointly implement the project on climate change

action in developing countries with fragile mountainous ecosystems from a subregional perspective and produced a document in the *Mountain Adaptation Outlook* series entitled "Outlook on climate change adaptation in mountain regions of Central Asia".

14. The International Hydrological Programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO) launched a project on the theme "Addressing water security: climate impacts and adaptation responses in Africa, the Americas, Asia and Europe" to contribute to the assessment of vulnerability and to map existing adaptation strategies in vulnerable regions such as mountains. The International Hydrological Programme has also coordinated glacier mass balance studies and training and capacity-building programmes in mountain regions. The UNESCO Man and the Biosphere Programme is engaged in sustainable mountain development and, in collaboration with the International Hydrological Programme, has developed exhibits, policy briefs and other publications on the impact of climate change in mountain regions.

15. At the intergovernmental level, ministers at the fourth session of the Conference of the Parties to the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention), held in 2014, adopted the Strategic Agenda on Adaptation to Climate Change in the Carpathian Region. The Carpathian Convention and its working group on adaptation to climate change were invited to join the European Climate Adaptation Platform, led by the European Environmental Agency. The Platform is a European Commission initiative to support Europe in adapting to climate change by sharing information on the topic.

16. The Central Asia hub of the Mountain Partnership works with regional stakeholders to integrate a mountain agenda into the development processes of countries in the region. In conjunction with the Centre for Climate Change and Disaster Reduction, based in Tajikistan, the Central Asia hub supports public engagement in policymaking through policy dialogues and local level consultations at the national and subnational levels in Tajikistan. Institutional capacity-building for the Climate Change Dialogue Platform of Kyrgyzstan is provided through an inclusive climate governance process to ensure informed and evidence-based decision-making.

17. The past three sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change saw mountain areas receive particular attention. At a meeting on building climate change resilience in mountains, held in Warsaw on 16 November 2013 at the Global Landscapes Forum, on the sidelines of the nineteenth session of the Conference of the Parties, local community empowerment was highlighted as being essential to building climate change resilience in mountains and mainstreaming climate change adaptation. In December 2014, during the twentieth session, representatives from mountainous least developed countries in Africa and Asia raised a common voice for mountain areas and the need for an equitable share of global climate funds to be allocated to address the impact of climate change and support adaptation in mountain areas. Side events outlined progress made in climate change adaptation, mitigation and monitoring in mountain environments worldwide and called for member States to join forces and share solutions and resources globally. During the twenty-first session, held in Paris in 2015, the Mountain Partnership convened a side event on the theme "Building climate change resilience in mountains", illustrating different approaches that had been adopted to build resilience.

Watershed management and sustainable forest management in mountains

18. An integrated landscape approach, which addresses natural resources management, water and food scarcity as well as climate change resilience, can lead to the sustainable development of upland areas and the improvement of community livelihoods. The water and mountains team of the FAO forestry department provides technical expertise on the topics of forest-water interaction, watershed management and sustainable mountain development, promoting and facilitating projects, processes and policies in mountain regions, including those in Ecuador, Guatemala, Kyrgyzstan and West Africa. A project entitled "Poverty alleviation and combating desertification through collaborative watershed management", implemented between 2010 and 2015 in Ecuador, Mauritania, Morocco and Peru, provided an opportunity to promote a harmonized approach to watershed management, build capacity, support institutional development and provide evidence-based policy advice. Lessons learned from recently completed watershed management projects underline the relevance of working across sectors, across scales and with multiple actors in an integrated landscape approach to generate not only environmental benefits but also social and economic co-benefits to improve mountain livelihoods and food security. Results also indicate a need to develop an indicator framework to measure and quantify those multiple benefits, as well as tools to support the analysis of intervention options and priority setting in the planning phase.

19. Assessments of the protective functions of forests with respect to soil and water have been undertaken through field tests conducted at pilot forest sites, including mountainous sites, in Mexico, Nepal and Viet Nam, with the aim to develop a cost-effective and accurate methodology to facilitate data collection, analysis and reporting, especially in developing countries, including by way of a survey made available online through open-source applications. Improving information on mountain forest functions will help managers formulate evidence-based plans and practices for disaster resilience and water security.

20. An FAO project funded by the Government of Italy on climate change and mountain forests addresses the nexus between poverty and the unsustainable use of natural resources that is faced by vulnerable mountain communities in both continental and island nations. The project is specifically linked to Sustainable Development Goals 1, 2, 13 and 15. One of the outputs of the project is the development of biodiversity monitoring tools for reducing emissions from deforestation and forest degradation in Papua New Guinea. To date, the project has developed a protocol for the assessment of the nation's forest biodiversity, which has been integrated into the design of the country's first national forest inventory as part of activities to reduce such emissions. Papua New Guinea is the first country among those involved in the process to reduce emissions from deforestation and forest degradation to carry out a systematic integration of forest biodiversity indicators with carbon stock indicators on a national scale. A combined carbon-biodiversity inventory aims to enable an objective assessment of the trade-offs between protecting biodiversity and reducing emissions, a precondition for guaranteeing sustainable forest management and improving local forest community livelihoods.

21. A project in Argentina on native forests and protected areas has reformed the legal and regulatory policy framework around Andean native forests and

strengthened the management and conservation of native forests. The Department of Planning and Environmental Policy of the Ministry of Health and Environment is leading the implementation of a project on the incentives for the conservation of ecosystem services of global significance, testing compensation mechanisms for the services provided by ecosystems in Argentina. A project on sustainable land management in the north-western area of Argentina is focused on the arid, semi-arid and subhumid areas of the country, with the objective of improving the quality of life in rural communities and preserving ecosystems.

22. At the Dushanbe Forum of Mountain Countries on the theme "Water and Mountains", held in 2015, Tajikistan called upon local and national governments, communities and development organizations to endorse Goal 6 on water and sanitation for all, to recognize the key role of mountains in achieving the Goal, and to adopt and apply integrated watershed management practices as a viable, enduring solution for coping with and adapting to changes in mountains, by recognizing the close interdependence between water and mountains.

Biodiversity conservation and mountain ecosystems

23. Mountains are storehouses of global biodiversity. They support around one quarter of terrestrial biological diversity and are rich in endemic species. Global warming, land use change, poaching and mining all exact a heavy toll on mountain biodiversity. The sustainable management of mountain biodiversity has increasingly been recognized as a global priority. The programme of work on mountain biodiversity, adopted in 2004 by the Conference of the Parties to the Convention on Biological Diversity, aims to reduce the loss of mountain biological diversity as a contribution to poverty reduction and to benefit both upland and lowland dwellers, including indigenous and local communities dependent on mountains.

24. The adoption of the 2030 Agenda and the Paris Agreement provided added impetus to the effective implementation of the programme of work on mountain biodiversity for achieving the Aichi Biodiversity Targets of the Strategic Plan for Biodiversity 2011-2020 and the Sustainable Development Goals in mountain ecosystems. As such, implementing the programme of work on mountain biodiversity will have a great impact with regard to multiple Sustainable Development Goals, including Goal 1 to end poverty, Goal 2 to end hunger, Goal 3 to ensure healthy lives and promote well-being, Goal 6 to ensure water availability, Goal 10 to reduce inequality and Goal 15 to protect, restore and promote sustainable use of terrestrial ecosystems. In addition, the Mountain Partnership is in a position to make contributions towards Goal 17 to strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

25. In 2014, the fourth edition of the *Global Biodiversity Outlook*[2] provided a midterm assessment of progress towards the Aichi Biodiversity Targets. It contained a call for reducing the direct pressures on biodiversity and promoting its sustainable use and reported that limited information was available regarding trends for some ecosystems that were especially vulnerable to climate change, including mountain ecosystems such as cloud forest and *páramos* (high altitude tundra in tropical

[2] Secretariat of the Convention on Biological Diversity, Global Biodiversity Outlook 4 (Montreal, 2014). Available from www.cbd.int/gbo4/.

Central and South America). A key action that, if more widely applied, could accelerate progress towards the goal of enhancing the benefits to all from biodiversity and ecosystem services would be to reduce the pressures on and, where necessary, enhance the protection and restoration of those ecosystems providing essential services, such as wetlands, coral reefs, rivers, forests and mountain areas.

26. The Global Mountain Biodiversity Assessment is a platform for international and cross-disciplinary collaboration in the assessment, conservation and sustainable use of mountain biodiversity. In cooperation with the Global Biodiversity Information Facility, the Global Mountain Biodiversity Assessment developed a mountain biodiversity portal providing geo-referenced primary biodiversity data on mountain ecosystems. With various features that allow for the browsing of species inventories by location, the localization of specific species and protected areas, the visualization of species ranges and the exploration of habitat suitability and reserve gaps, the mountain diversity portal and the Map of Life application on which it is based, represent powerful tools for all user categories, ranging from laymen to practitioners, stakeholders (such as the tourism industry) and policymakers.

27. In 2015, the European Union and the Government of Colombia announced the launching of a programme entitled "Páramo: biodiversity and water resources in the northern Andes". Fundación Ecohabitats, in partnership with the University of Innsbruck and with the support of the Austrian Academy of Sciences, developed a white paper on the biosphere reserves of Colombia as part of a strategy to promote national awareness for the conservation of those areas, to define and apply conservation and sustainable management strategies, including integrated ecosystem management, to develop financial instruments to support maintenance of ecosystem services, in particular hydrological regulation, and to strengthen the capacities of indigenous peoples and farmers to develop sustainable activities in the *páramos*.

28. Projects are also being undertaken by Fundación Agreste in Argentina to map the variety, quantity and locations of species, their current status and evolution, and to collectively develop strategies to conserve and sustainably manage endangered spices.

Land degradation and desertification

29. Dryland mountains, with a predominance of unstable soils on steep slopes and extreme weather conditions, are especially vulnerable to desertification processes, soil degradation, water erosion, loss of chemical and physical quality, deforestation and vegetation degradation and loss. Sustainable land management is, therefore, crucial to securing the natural resources base as well as the livelihoods of people in mountainous areas in order to achieve a land degradation-neutral world in the context of sustainable development.

30. World Overview of Conservation Approaches and Technologies, a global network active in over 56 countries, was officially recognized by the secretariat of the United Nations Convention to Combat Desertification as the primary recommended database for sustainable land management best practices, which include more than 300 technologies from more than 50 countries.

Disaster risk management in mountains

31. Mountainous areas are frequently affected by natural hazards such as landslides, mudslides, debris flows and floods. These hazardous events are often induced by intense precipitation and are therefore exacerbated by climate change and changes in the hydrological cycle. As stated in the Sendai Framework for Disaster Risk Reduction 2015-2030, it is essential to promote the mainstreaming of disaster risk assessment, mapping and management in rural development planning, including in mountain areas. To reduce vulnerability, disaster risk-reduction measures such as early-warning systems, responsible building, identification of safe locations and preservation of ecosystem protective functions must be put in place.

32. In its immediate response to the disastrous earthquakes that hit Nepal in 2015, FAO joined the global relief effort by assisting a total of 1.5 million people and distributed essential crop seeds, including rice, maize, wheat and vegetable seeds, as well as grain storage bags, to affected communities. The International Centre for Integrated Mountain Development, in collaboration with the Government of Nepal's National Planning Commission, launched a strategic framework for resilient livelihoods in earthquake-affected areas of Nepal, which explored a range of strategic choices and options for developing resilient livelihoods in the aftermath of the earthquakes.

33. The Government of Pakistan has implemented a project to reduce the risks and vulnerabilities from glacier lake outburst floods by enabling vulnerable communities in northern Pakistan to better understand and respond to the risks of such floods and thereby adapt to growing climate change pressures.

34. In 2013, the first International Forum on Glaciers concluded with the Huaraz Declaration, which was signed by 22 institutions, the aim of which was to promote, implement and launch mechanisms for the monitoring and early warning of natural hazards caused by rapidly retreating glaciers.

35. During the third United Nations World Conference on Disaster Risk Reduction, held in Sendai, Japan, in March 2015, the long-standing cooperation between FAO and the International Consortium on Landslides was renewed with the signature of the Sendai Partnerships 2015-2025 for Global Promotion of Understanding and Reducing Landslide Disaster Risk.

Indigenous peoples

36. The involvement of indigenous and traditional mountain communities is a prerequisite for sustainable mountain development. They are custodians of natural resources and holders of traditional techniques and practices. The International Network of Mountain Indigenous Peoples met at a workshop in Bhutan from 26 May to 1 June 2014 to discuss responses to the impact of climatic change on their food and farming systems and issued the Bhutan Declaration on Climate Change and Mountain Indigenous Peoples.

37. In an effort to support the livelihoods of indigenous peoples in remote areas of the Chittagong Hill Tracts in Bangladesh, actions are under way to support critically food insecure rural men and women and increase their resilience to chronic and seasonal shocks, stressing the use of an integrated approach that includes the

distribution of agricultural inputs, cash transfers and extensive training programmes on vegetable and fruit production, poultry management, nutrition, food safety and food preparation.

Gender (Goals 4 and 5)

38. Women are often the primary managers of mountain resources, guardians of biodiversity and the main actors engaged in agriculture, animal husbandry and other small-scale economic activities. Mountain women and girls are often left to manage farms and households when men migrate to lowland areas or abroad in search of higher incomes. However, women and girls are often excluded from further education, access to credit, rights to land and social protection policies.

39. The Utah International Mountain Forum hosted the fourth International Women of the Mountains Conference at Utah Valley University in October 2015 to address the critical issues faced by women and children living in mountainous regions across the globe and provide a forum to discuss gender equality. The outcome document contained the following observations:[1]

(a) Goal 5 could be achieved through strong support for improving women's rights and welfare, including women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life;

(b) Successful implementation of target 6.6 could be achieved by supporting the vital role that women play in the protection of the environment and water sources, particularly as custodians of traditional knowledge that builds resilience and allows for adaptation to climate change;

(c) With respect to target 15.1, women play a critical role in joint planning as promoters of innovation, development and cooperation for common benefit.

40. In Kyrgyzstan, the Agency of Development Initiatives, a network of women's self-help groups, is assisting more than 5,000 households in rural mountain areas in improving agricultural production, eradicating poverty, strengthening food security and adapting to climate change.

41. At the Dushanbe Forum of Mountain Countries, held in 2015, participants proposed granting women equal access to water, land and other resource entitlements in mountainous areas and creating a more favourable investment climate to support rural women engaged in the development of small and medium enterprises in mountain regions.

Migration and urbanization in mountains

42. Out-migration from mountains may lead to the abandonment of mountain land management and to the modification of livelihoods. Further attention should be given to the nexus between climate change, food security, water and out-migration.

[1] "The final document of the fourth International Women of the Mountains Conference". Available from www.womenofthemountains.org/images/2015/16-03-31-WOMC-Finalized.pdf.

The fifth report on the state of the Alps[4] tackled the topic of demographic change in the Alps. Through a statistical analysis of data, it was determined that the population of the Alps is neither homogenously increasing or decreasing, but rather is increasing in the most accessible alpine areas and decreasing, albeit not homogeneously, in more remote areas.

Mountain economies and livelihoods (Goals 2, 8 and 12)

43. Economic development in mountains follows a different path from that in lowlands. The greater complexity of the mountain landscape requires a more integrated approach to overcome challenges such as inaccessibility, fragility and marginality and to build upon strengths such as cultural richness, biological diversity, high-quality niche production and traditional knowledge. Commercial and sustainable harnessing of high-value mountain products and services presents a significant opportunity for mountain communities, especially smallholders and women, to improve their livelihoods, generating additional employment and income.

44. An international symposium on the mountain economy, held in Guiyang, China, in May 2014, focused on the interrelated social, environmental and economic components that form the framework for sustainable mountain development. Participants agreed that good governance, strong rural institutions and inclusive policies are essential to strengthening economies in remote mountain areas and highlighted the importance of building upon traditional knowledge, empowering local government authorities and involving local communities in decision-making processes in order to achieve sustainable economic growth.

45. The Philippine Forest Honey Network, a network of mountain-based honey enterprises, has established harvesting protocols and quality standards for honey processing. The Network has published a guidebook on sustainable management of honey for honey consolidators. In 2014, the provincial government of Negros Occidental Province enacted a provincial ordinance on building a green economy and sponsored the Negros Island Organic Farmers Festival, which brought together provincial mountain producers and private businesses under the "Organic na Negros!" producers and retailers association.

46. The Mountain Partnership secretariat and Slow Food are joining forces to promote the use of mountain products to empower mountain smallholders and producers, especially women, worldwide by developing a voluntary certification scheme to brand high-value mountain products as a strategy to boost local economies in mountain regions. Value chain analyses are being conducted in Bolivia (Plurinational State of) and Kyrgyzstan with the aim of identifying bottlenecks and providing solutions. A model will be developed for upscaling in other countries. Similar initiatives are also under way in Panama, Romania and Spain.

[4] Permanent Secretariat of the Alpine Convention, ed., *Demographic Changes in the Alps: report of the state of the Alps*, 2015. Available from www.alpconv.org/en/publications/alpine/Documents/RSA5en.pdf.

Tourism (Goal 8)

47. For services such as tourism, mountain communities represent uniquely preserved ecosystems and traditional ways of life. If sustainably managed and if benefits reach the local communities, tourism-related services such as skiing, climbing, cultural heritage and nature trails can provide an opportunity for development in mountain regions.

48. UNEP is a partner in a project entitled "Innovation in Rural Tourism", funded by the Lifelong Learning Programme of the European Commission. The project aims at developing a set of tools for the development of sustainable tourism in rural areas, specifically in mountainous regions, through a community consultation process and training programmes.

49. At a meeting of the Emblematic Mediterranean Mountain Network, held in Razlog, Bulgaria, in May 2015, the participants, including partners from Bulgaria, France, Greece, Italy and Spain, approved a charter to protect and sustainably develop European emblematic mountains and are planning to expand to other mountain regions.

50. In 2014, the Avalon Historico-Geographical Society implemented a Global Environment Facility (GEF)/UNDP small grants programme project entitled "Ecotourism in central Kazakhstan: conservation of protected area natural resources and creation of economic opportunities in the rural areas".

51. A mountain museum alliance, led by the Museo Nazionale della Montagna (Duca degli Abruzzi) in Turin, Italy, was formed in December 2015 under the auspices of the Mountain Partnership to link the cultural activities of the world's mountain area museums as well as share data and collections.

Renewable energy (Goal 7)

52. Mountains play a key role in providing renewable energy, especially through hydropower, solar power, wind power and biogas, for downstream cities and remote mountain communities. Hydropower currently provides around one fifth of all electricity worldwide, and some countries rely almost exclusively on mountain regions for hydropower generation. In Bolivia (Plurinational State of), Chile, Colombia and Peru, at least 95 per cent of hydropower is generated in mountain regions. In the past three years, Mountain Partnership member Global Himalayan Expedition has been promoting "impact tourism" and setting up solar microgrids for off-grid remote Himalayan communities. To date, the group has been able to provide 10 villages with access to electricity. The group plans to take forward its mission to provide electricity to 40 villages next year and directly impact more than 20,000 lives.

53. The current German presidency of the Alpine Convention (2015-2016) supports the establishment of a virtual alpine observatory and the collection of best practices in the field of renewable energies.

Policy and law

54. Thanks to years of support from the Mountain Partnership secretariat, national mountain committees in a number of countries are developing strategic plans, creating fair polices and laws and implementing sustainable development projects.

55. In 2014, a Mountain Partnership secretariat/FAO project led to the establishment by Argentina, Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru of a regional mechanism to address mountain issues in the Andes. The project also aims to improve the participatory management of natural resources in the Andes by strengthening national institutions, increasing political attention and sharing knowledge about mountain ecosystems.

56. A national mountain committee was created by Chile in September 2014. Seven ministers and seven service chiefs signed a decree forming a working group, which aims to advise diverse government institutions on strategies for Chile's sustainable mountain development.

57. The Government of Peru, during a meeting convened in San Isidro in May 2015, approved the formation of a technical group to work on mountains as part of the country's national committee on biological diversity.

58. Mountain Partnership members in Africa are carrying out advocacy on mountain-related issues in the region. Sustainable mountain development was mainstreamed in the first African mountains regional forum, on the theme "Towards a shared mountain agenda for Africa", which was held in Arusha, United Republic of Tanzania, in 2014. The forum outcome document included recommendations that the African Union, the African Ministerial Conference on the Environment and the regional economic communities develop and implement a sustainable mountain development agenda and strategy for Africa; that an Africa regional mountains forum be established to share knowledge, information and policy dialogue; and that African Governments develop and implement mountain specific policies, laws and programmes. The forum also welcomed the initiation of an African sustainable mountain development fund by the Albertine Rift Conservation Society, in collaboration with the Swiss Agency for Development and Cooperation. The next World Mountain Forum will be held in Uganda in 2016.

59. UNEP launched the Africa Mountains Atlas[5] during the fifteenth session of the African Ministerial Conference on the Environment, held in Cairo in 2015. The Atlas includes maps and satellite data from 53 African countries to illustrate the challenges facing Africa's mountain areas. Forest and water resources and initiatives to improve food security and livelihoods of mountain communities across Africa are highlighted therein. On the basis of the Atlas and the mandate of the Ministerial Conference, UNEP, together with the East African Community, GRID-Arendal and the Albertine Rift Conservation Society are currently preparing a report, to be released in 2016, on sustainable mountain development in East Africa in a changing climate.

60. In the Ministerial Conference outcome document,[6] African ministers of the environment agreed to use the Africa Mountains Atlas to take national and regional

[5] UNEP, *Africa Mountains Atlas*, 2014. (Nairobi, UNEP, 2014).

[6] "Cairo Declaration on Managing Africa's Natural Capital for Sustainable Development and Poverty Eradication". Available from www.un.org/en/africa/osaa/pdf/au/ cap_naturalcapital_2015.pdf.

action to strengthen sustainable mountain development by developing institutions, policies, laws and programmes, as well as by strengthening existing transboundary and regional frameworks on sustainable management of African mountain ecosystems.

61. The Ministry of Environment, Ecology, Sea and Forests of Madagascar produced a national framework document in 2015 that aligned the sustainable development of mountain areas with the environmental guidelines in its general national policy. The framework document suggested opportunities for the integration of sustainable mountain development into the implementation of the environmental guidelines and proposed the establishment of a national committee.

62. In Zimbabwe, mountain ecosystems play a critical role in providing water, food and biodiversity, regulating and limiting the impact of variations in weather and temperature and serving as centres for tourism and cultural preservation. Because of the role such ecosystems play in regulating the environment, the Government of Zimbabwe has developed a targeted programme for mountain ecosystem protection. The protection of mountain ecosystems is integrated into national legislation through a specific statutory natural resources instrument.

63. WikiAlps, an encyclopaedia-like platform, provides ready-to-use information about selected territorial development projects of the European Union to support policymaking. The online platform enables easy access to information generated by the Alpine Space Project, a transnational programme of the European Union that aims to promote sustainable development of the Alpine region.

64. In 2013, the European Council invited the European Commission, in cooperation with member States, to elaborate a European Union strategy for the Alpine region that focused on three action-oriented policy areas: (a) economic growth and innovation, to provide equal access to jobs by building on the competitiveness of the region; (b) transport and connectivity, for sustainable internal and external accessibility; and (c) environment and energy, for a more inclusive environmental framework and for renewable and reliable energy solutions for the future.

Education, extension, capacity-building and research (Goal 8)

65. Since 2008, the annual International Programme on Research and Training on Sustainable Management of Mountain Areas has been organized by the Mountain Partnership secretariat, the University of Turin (Italy), FAO and the town of Ormea, Italy, to offer a summer course on sustainable mountain development targeting national government officials, technicians and experts working in developing mountain regions. In 2014, the theme of the course was linked to the International Year of Family Farming. In 2015, the course focused on food security in mountain regions. The theme for 2016 will be on the role of protected areas in the management of mountain resources and diversity.

66. A course on sustainable mountain development, offered in Costa Rica in 2015 and 2016, was developed by the Centro Agronómico Tropical de Investigación y Enseñanza, the Fundación para el Desarrollo de la Cordillera Volcánica Central and the ProalSUR development agency.

67. A distance learning course on sustainable development of the mountain regions of Kyrgyzstan for teenage students from remote mountain villages was designed jointly by the non-governmental organizations Ekois and Yrystan, with support from the Central Asia hub of the Mountain Partnership, for regional mountain stakeholders from Tajikistan and the Altai Republic of the Russian Federation.

68. The Mountain Futures Conference, held in Kunming, China, in March 2016, was organized by the World Agroforestry Centre, with support from the Swiss Agency for Development and Cooperation and the International Centre for Integrated Mountain Development and other partners, to combine tradition and scientific research in order to upscale sustainable practices for the future of the world's mountainous regions. The Mountain Futures Initiative, launched at the Conference, will institute a multi-stakeholder platform for the pursuit of mountain research and the development of sustainable mechanisms for the identification and development of best practices.

69. The Mountain Research Initiative, funded by the Swiss National Science Foundation, the Swiss State Secretary for Education and Research and the Swiss Agency for Development and Cooperation, advances global change research in mountain regions worldwide through focused projects, regional networks and events. In 2014, to address a potential increase in climate warming at higher elevations and to design targeted observational campaigns, the Initiative held a global fair and workshop on long-term observatories for mountain social-ecological systems in Reno, United States of America, to address the state of mountain observation. The Initiative is building a global database and map of mountain observatories and is working with the Institute of Mountain Research of the Austrian Academy of Sciences on the creation of a Swiss-Austrian alliance for the promotion of research on sustainable development in European mountain regions.

70. The highest climate monitoring station in the Baltoro area of Pakistan was installed near the K2 base camp in July 2014 as part of an international monitoring project, promoted by the Ev-K2-CNR Committee, on high-altitude environmental research stations.

71. During the 20th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Lima in December 2014, the President of Peru, Ollanta Humala, together with the Peruvian Minister of Environment and the Secretary-General of the United Nations, announced the establishment of the National Institute of Research on Glaciers and Mountain Ecosystems.

72. The "Forum Carpaticum 2014: Local Responses to Global Challenges" held in Lviv, Ukraine, from 16 to 19 September 2014, was organized by Science for the Carpathians and UNEP and provided a discussion platform for over 100 scientists as well as practitioners and representatives of government entities and NGOs in the areas of policy, economy, environment and management interested in the Carpathian Mountains. The fourth such forum will be held in Bucharest in September 2016.

73. UNEP, in collaboration with the University of Geneva, has established a scientific network in the Caucasus Mountains region consisting of universities and academies of science in the wider Caucasus area, including Iran (Islamic Republic of) and Turkey. UNEP is also a partner in a project on assessing the impact of

climate change and its effects on soil and water resources in polar and mountainous regions, coordinated by the International Atomic Energy Agency. Finally, UNEP is partnering with major research organizations in a Horizon2020 research project on ecosystem management known as "Ecopotential". In November 2016 the "Caucasus Mountain Forum" will be held in Tbilisi.

74. The Eastern Highlands Initiative was launched in Zimbabwe in 2013 with the aim of focusing research on the eastern highlands of Zimbabwe and adjacent Mozambique through a variety of scientific projects centred on topics such as biodiversity gaps, the eastern highlands in Afromontane biogeography and the historical and current impact of human activities in the eastern highlands.

75. An international conference on the theme "Perth III: mountains of our future Earth" was held in October 2015, bringing together scientists from some 60 countries to present the latest scientific knowledge on global changes in mountain regions.

Advocacy, communications and knowledge management

76. The world celebrates mountains each year on 11 December. As the lead coordinating United Nations agency for the preparation of the celebration of International Mountain Day, FAO works with decentralized offices, Governments and civil society entities in many countries to organize events that raise awareness of the relevance of mountains to sustainable development. International Mountain Day also brings about government action and heightens cooperation at the national and regional levels.

77. In 2013, the theme of International Mountain Day was "celebrating mountain life". In 2014, the theme was "mountain family farming", during which time an event highlighting perspectives on mountains and rural development in a post-2015 world was co-organized at United Nations Headquarters in New York to highlight the role of mountain farming in family farming. In 2015, the theme was "Promoting mountain products". A publication on mapping the vulnerability of mountain peoples to food insecurity was launched at FAO during the 2015 celebrations. The secretariat of the Alpine Convention, together with its partners across the Alps and beyond, organized events dedicated to the reading of modern Alpine literature, on the theme "Reading Mountains".

78. To increase awareness and inspire concrete policy action on sustainable mountain development, the Mountain Partnership secretariat, in partnership with various member entities, issued publications on mountain farming,[7] to tie in with the International Year of Family Farming in 2014, and on mountain soils[8] to mark the International Year of Soils in 2015. The secretariat also produced fact sheets for International Mountain Day in 2013, 2014 and 2015 as well as posters in all six official United Nations languages, disseminated information on the International Mountain Day activities planned by members on the trilingual International Mountain Day website and produced several videos.

[7] Wymann von Dach and others (eds.), *Mountain Farming is Family Farming: a Contribution from Mountain Areas to the International Year of Family Farming 2014* (FAO, Rome, 2013).

[8] R. Romeo and others, *Understanding Mountain Soils: a Contribution from Mountain Areas to the International Year of Soils 2015* (FAO, Rome, 2015).

79. The international peer-reviewed journal *Mountain Research and Development* shares knowledge on sustainable mountain development issues by bringing together research findings and validated development experience.

80. The Swiss Agency for Development and Cooperation, the Centre for Development and Environment and other partners produced a number of relevant publications, including *Mountains: Our Life, Our Future* (2013), *Tourism in Mountain Regions* (2014), *Mountains and Climate Change* (2014), *Green Economy and Institutions for Sustainable Mountain Development* (2015), and *Investing in Sustainable Mountain Development* (2016). The Swiss Agency for Development and Cooperation also produced videos on mountains and climate change and sustainable mountain tourism.

81. The report entitled "Youth participation in the Alps", released by the International Commission for the Protection of the Alps, is the first to provide an Alpine-wide view of the participation of youth in parliaments, institutions and other legal structures.

82. The Aspen International Mountain Foundation, in partnership with the Telluride Institute, has established VERTEX, a website that serves as a platform to engage Mountain Partnership members and other mountain stakeholders in North and Central America and the Caribbean region by facilitating dialogue and exchanges.

83. A week-long celebration of mountains took place during the Universal Exposition, or Expo, held in Milan, Italy, in June 2015. Organized by the Italian Ministry of the Environment, as the Italian delegation to the Alpine Convention, in collaboration with UNEP, the secretariats of the Carpathian Convention and the Mountain Partnership, and the European Academy of Bolzano, the events focused on sustainable mountain development in the context of food security.

84. The second World Mountain Forum, held in Cuzco, Peru, in May 2014, gathered some 200 mountain stakeholders from across the globe to promote concrete action for sustainable mountain development and contribute to multilateral negotiations on the 2030 Agenda and the Paris Agreement.

Partnerships, transboundary cooperation and conventions

85. The Mountain Partnership is a United Nations voluntary alliance that currently includes more than 270 members, including Governments, intergovernmental organizations and major groups. It brings together countries, groups and organizations to work towards the common goal of improving the lives of mountain people and protecting mountain environments around the world.

86. The International Centre for Integrated Mountain Development is implementing a medium-term action plan (2013-2017) comprising six regional programmes promoting mountain-friendly policies and practices. The key features of those regional programmes include:

(a) Adaptation to change: innovative solutions for the diversification of livelihoods and income enhancement opportunities for mountain communities that include value chain development, flood early-warning systems and community water management strategies in Bangladesh, Bhutan, India, Myanmar, Nepal and Pakistan;

(b) Transboundary landscapes: a regional cooperative framework focused on the Kailash sacred landscape, involving China, India and Nepal, for the conservation and sustainable use of natural resources, the setup of social and ecological long-term monitoring and the implementation of an initiative to reduce emissions from deforestation and forest degradation in Bhutan, India, Myanmar, Nepal and Pakistan;

(c) River basins: the management of the regional flood early-warning system in the Ganga, Indus and Brahmaputra river basins through the systematic exchange of data among Bangladesh, Bhutan, Nepal and Pakistan, a community-based flood early-warning system and understanding the nexus between water and food;

(d) Cryosphere and atmosphere: the development of the first-ever comprehensive knowledge base on snow, glaciers, permafrost and glacial lakes in Bhutan, Nepal and Pakistan, improving the understanding of cryosphere dynamics and linkages to international research networks;

(e) Mountain environment regional information system: an information platform for earthquake disaster relief and recovery operations, providing timely and credible information and supporting geohazard assessments by the Government of Nepal and other Himalayan countries;

(f) Himalayan university consortium: the promotion of a network of regional universities to generate high-quality knowledge, capacity-building for young scientists and skills for sustainable mountain development.

87. In a bid to mobilize support and commitment to regional cooperation for sustainable mountain development, the Hindu Kush Himalayan Partnership for Sustainable Mountain Development was endorsed in 2016 by ministers and high-level government representatives from Afghanistan, Bangladesh, Bhutan, Myanmar, Nepal and Pakistan as well as delegates from the United Nations Environment Assembly and the International Centre for Integrated Mountain Development. The Partnership aims to promote a mountain agenda in the context of the Paris Agreement and the 2030 Agenda, particularly Goal 17 of the Agenda, aimed at revitalizing global partnerships for sustainable development.

88. In 2013, the Government of Switzerland launched a programme to promote sustainable mountain development for global change that links aspects of sustainable mountain development to global issues such as water, food security, energy, migration and extreme events. The programme targets four major mountain regions and relies on cooperation with the Centre for Development and Environment, the Albertine Rift Conservation Society, the Consortium for Sustainable Development of the Andean Ecoregion, the Foundation for Sustainable Development in Mountain Regions, the International Centre for Integrated Mountain Development, the University of Central Asia and the University of Zurich.

89. The Protocol on Sustainable Forest Management and the Protocol on Sustainable Tourism to the Framework Convention on the Protection and Sustainable Development of the Carpathians entered into force in 2013. The Protocol on Sustainable Transport was adopted by the fourth session of the Conference of the Parties in September 2014.

90. The Alpine-Carpathian Joint Statement on Adaptation to Climate Change was adopted at the thirteenth Alpine Conference, held in Turin, Italy, in November 2014,

and by the fourth session of the Conference of the Parties to the Carpathian Convention, held in Mikulov, Czech Republic, in September 2014, and was jointly presented within the twentieth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Lima in December 2014.

91. The delegation of Italy to the Alpine Convention, UNEP, and the secretariats of the Carpathian Convention and the Mountain Partnership supported the organization of an international conference to form a network for the Mediterranean mountains and to decide upon starting points and common projects for the sustainable development of mountain areas of the Mediterranean, which took place in Ventimiglia, Italy, in November 2015.

Recommendations

92. The 2030 Agenda and the Paris Agreement provide unique opportunities for addressing the complex and multiple challenges that mountain ecosystems and peoples are facing and call for sustainable development in mountains to be urgently addressed. The General Assembly may wish to consider the following recommendations:

Recommendations related to international processes

93. Recommendations include:

- To renew efforts to ensure that mountain issues are prioritized within development agendas and processes, and integrated into the three Rio Conventions in particular, by building or strengthening specific mountain mechanisms and programmes of work.
- To support the implementation and monitoring of the mountain-related Sustainable Development Goals, including Goals 6 and 15, as well as those goals which have strong linkages to mountain ecosystems and peoples, in particular Goals 1, 2, 4, 5, 8, 10, 12, 13 and 17.
- To promote, where relevant, regional mechanisms for coordinated and integrated transboundary cooperation for sustainable mountain development; support existing mechanisms, such as the Alpine Convention, the Carpathian Convention and the Andean regional mechanism; and promote the exchange of experiences and lessons learned.

Policy recommendations for sustainable mountain development

94. Recommendations include:

- To encourage Member States to include mountain-specific policies in national sustainable development strategies and further consolidate or establish national committees, bodies and mechanisms to strengthen intersectoral collaboration for sustainable development in mountain areas.
- To ensure that marginalized groups, especially women, girls and indigenous peoples, are included in development policy and planning in mountain regions and benefit from social protection schemes and, in particular, that access and agreed rights to land and natural resources are respected and mountain multiculturalism is valued.

- To support education, extension and capacity-building programmes, especially among local mountain communities and relevant stakeholders, to further sustainable mountain development at all levels, building in particular on the experiences of the International Programme on Research and Training on Sustainable Management of Mountain Areas.

Recommendations related to financial mechanisms

95. Recommendations include:

- To increase levels of investment and funding for sustainable mountain development through the involvement of main resource partners, the private sector, foundations and local authorities.
- To encourage Member States to access financial mechanisms such as the Green Climate Fund and GEF to promote climate change action in mountain areas.
- To financially support the newly launched Mountain Facility.
- To explore innovative funding modalities such as compensating suppliers of mountain ecosystem goods and services for doing so in ways that support sustainable development and environmental stewardship.

Recommendations for awareness-raising

96. Recommendations include:

- To support the development and implementation of communications, capacity-building, advocacy and outreach activities for sustainable mountain development at all levels, taking advantage of the opportunities provided annually on 11 December by the International Mountain Day and other International Days, and build upon the outreach potential of Mountain Ambassadors such as celebrities, youth and government representatives to reach to a broader public.
- To support the collaborative efforts of the Mountain Partnership and encourage the further commitment of relevant government, civil society and private sector institutions to the Partnership.

Recommendations for research

97. Recommendations include:

- To support coordinated research efforts and promote the collection of disaggregated data to gain an improved understanding of environmental, economic and social drivers of change affecting mountain regions and endorse the establishment of regional centres and networks to better understand the vulnerability of mountain communities and to provide sound evidence for policy advice aimed at increasing their resilience.